501.25507CX5

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appellants: YOKOMIZO et al

Serial No.: 08/470,424

Filed: June 6, 1995

For: Fuel Assembly And Nuclear Reactor

Group: 3663

Examiner: D. Greene

APPELLANTS' REPLY BRIEF

Mail Stop: Appeal - Patents (Fee)
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

January 17, 2006

Sir:

This Reply Brief is submitted in response to the Examiner's Answer having a communication cover sheet dated November 17, 2005, even though the Examiner's Answer has a mail date stamp of November 16, 2005, and this Reply Brief is submitted in accordance with the procedures set forth in 37 CFR §41.41.

The Examiner Has Misconstrued The Claim Language And The Language Of The Disclosure In Attempting To Support Rejections Under 35 USC 112, First and Second Paragraphs

The Examiner at pages 4 and 5 of the Examiner's Answer contends that "There is no support in the original disclosure (including page 15, line 33 to page 16, line 3... for the limitation of the definition of the fuel cycle ...". More particularly, the Examiner states in relation to the rejection under 35 USC 112,

first paragraph:

> Note that Appellants' claims incorrectly indicate that the "renewing" takes place while the fuel assembly is in the nuclear reactor.

With regard to the rejection under 35 USC 112, second paragraph, the Examiner states:

> The claims are vague, indefinite, incomplete, misdescriptive and inaccurate in indicating that the renewing of the fuel assembly takes place while the fuel assembly is still in the nuclear reactor. (emphasis added).

Irrespective of the position by the Examiner, the claims and the disclosure do not set forth that the renewing takes place "while the fuel assembly is in the nuclear reactor". (emphasis added)

Claim 24, for example, recites the feature that "one fuel cycle is an operation period of the nuclear reactor from when fuel assemblies in the nuclear reactor are replaced and operation nuclear reactor is started to when the nuclear reactor is stopped for renewing at least one of the fuel assemblies in the nuclear reactor". (emphasis added) As is apparent, this language does not recite "while the fuel assembly is in the nuclear reactor" (emphasis added), as contended by the Examiner.

The language of claim 24 and the other independent claims of this application which is similar thereto is supported by the description the paragraph bridging pages 15 and 16 of the specification of this application which provides:

> Concretely described below is how to operate the boiling-water reactor while changing void fraction in the water rod 19 under the condition where the fuel assembly 10 is loaded in the reactor core of the boiling-water reactor. This operation method applies for

> one fuel cycle (operation period of a nuclear reactor from when the fuel in the reactor core is replaced and operation of the nuclear reactor is started to when the nuclear reactor is stopped for renewing the fuel, i.e., usually one year. (emphasis added).

Irrespective of the Examiner's contentions, appellants note that "renew" is considered to be a synonym for "replace" as utilized in the context of the disclosure of this application. In any event, as is apparent, the fuel cycle begins from a period of starting of operation of the nuclear reactor (from a stopped condition wherein fuel assemblies are replaced) to when the nuclear reactor is stopped for renewing or replacement of fuel in at least one of the fuel assemblies. Whether or not the specification or claims of this application might have utilized the term "of" the nuclear reactor rather than "in" the nuclear reactor, it is readily apparent that renewing or replacement of fuel a fuel assembly requires stopping of the nuclear reactor for effecting renewal or replacement of the fuel of the fuel assembly, and there is no requirement for such replacement or renewal to take place while the fuel assembly is in the nuclear reactor, as contended by the Examiner. In this regard, appellants submit that this manner of refueling whether by replacement or renewal of the fuel is disclosed in US Patent No. 4,285,769, which is cited in the specification of this application. Thus, appellants submit that the rejections under 35 USC 112, first and second paragraphs, are based upon a misconstruction of disclosed and claimed invention by the Examiner.

Citation of New Art By The Examiner

In the Examiner's Answer, at page 3, the Examiner newly cites two US Patents, i.e., 4,732,730 and 3,208,912, to further support the Examiner's position, although not cited in any rejections. Appellants submit that the citation of new art in the Examiner's Answer and failure to include the same in any rejection, is improper. See In re Hoch, 428 F.2d 1341, 166 USPQ 406 (CCPA 1970). Thus, discussion of such newly cited art is considered unnecessary.

The Examiner Misconstrues The Claim Language

At page 23 of the Examiner's Answer, the Examiner states:

> Regarding the second paragraph on page 24 of Appellants' Brief that Sofer and Japan 61256282 fail to disclose or teach "the complete filling of the water rod by the coolant in each fuel cycle" it is noted that the claims do not contain such a limitation. The claims only disclose this limitation during the "another" period, not "each fuel cycle".

Looking to claim 24, this claim recites the features of:

> raising a coolant surface formed between the coolant and a vapor in the at least one water rod by increasing the flow rate of the coolant supplied to the core based on increasing a number of revolutions of the pump during one period from a beginning of one fuel cycle, which one fuel cycle is an operation period of the nuclear reactor from when fuel assemblies in the nuclear reactor are replaced and operation of the nuclear reactor is started to when the nuclear reactor is stopped for renewing at least one of the fuel assemblies in the nuclear reactor, and before an end of the one fuel cycle; and
>
> further increasing the flow rate of coolant supplied to the core based on increasing the number of revolutions of the pump during another period after the one period to an end of the one fuel cycle in a state in which the at least one water rod is completely filled with the coolant. (emphasis added)

More particularly, claim 24 recites the feature that one fuel cycle "is an operation period of the nuclear reactor from when fuel assemblies in the nuclear reactor are replaced and operation of the nuclear reactor is started to when the nuclear reactor is stopped for renewing at least one of the fuel assemblies in the nuclear reactor". Furthermore, claim 24 recites the feature of "raising a coolant surface formed between the coolant and a vapor in the at least one water rod by increasing the flow rate of the coolant supplied to the core based on increasing a number of revolutions of a pump during one period from a beginning of one fuel cycle ... and before and end of the one fuel cycle" (emphasis added). Thus, the coolant surface is raised in the manner indicated during "one period", which is prior to the end of the one fuel cycle, which end of the fuel cycle is delimited by the stopping of the nuclear reactor for renewing at least one of the fuel assemblies in the nuclear reactor. Claim 24 further recites "increasing the flow rate of coolant supplied to the core based on increasing the number of revolutions of the pump during another period after the one period to an end of the one fuel cycle in a state in which the at least one water rod is completely filled with the coolant" (emphasis added). Thus, it is apparent that both of the "one period" and the "another period" occur during "one fuel cycle" and that the "another period", which occurs during the one fuel cycle, extends from "after the one period to an end of the one fuel cycle". Further, during such "another period", which is within the one fuel cycle, "the at least one water rod is complete filled with coolant". As described in the specification of this application at page

18 of the specification in connection with Figs. 3A - 3C, Fig. 3A and 3B illustrate a water rod in which water and vapor is present in the water rod, whereas Fig. 3C illustrates that the water rod is completely filled with water. That is, as described at page 17, lines 4 - 17 of the specification, when the flow rate in the reactor core is smaller than 100%, which is continued for about 70% of a fuel cycle period, the water rod in the fuel assembly assumes the condition as shown in Fig. 3A, wherein the upper portion of the coolant ascending path 25 and the interior of the coolant descending path 26 are filled with vapor. As described at page 18, lines 17 - 22 of the specification, when the flow rate in the reactor core is greater than 110%, the interior of the water rod 19 assumes the condition of Fig. 3C, where the liquid flows in the form of a single-phase stream and no vapor stays in the coolant descending path 26. Thus, it is apparent that in this condition of Fig. 3C, the water rod is completely filled with the coolant, with Fig. 17(d) showing the increase in the manner recited in claim 24, for one fuel cycle. As described in the paragraph bridging pages 18 and 19 of the specification, the fuel assembly 1 experiences the fuel cycle operation four times in the reactor core, and therefore, the conditions of Fig. 3A, 3B and 3C are alternatingly repeated four times, noting the dashed vertical line in Fig 17(d) corresponds to the ending of each fuel cycle, and as clearly recited in claim 24 and the other claims of this application, both the "one period" and the "another period" occur during one fuel cycle with the "another period" occurring "after the one period to an end of the one fuel cycle", at which time "the at least one water rod is completely filled with coolant".

Appellants submit that, contrary to the position set forth by the Examiner, claim 24 and the other independent claims of this application recite the same feature, of "the complete filling of the water rod by the coolant" in one fuel cycle and therefore in each fuel cycle, which is an operational period as defined in the claims of this application.

The Examiner does not suggest that Sofer alone or Japan 61256282 taken alone, or in combination, disclose or teach such recited feature of the independent claims of this application. Rather, the Examiner apparently contends that it is not necessary for the cited art to disclose or teach the recited feature of claim 24 and the other independent claims because the Examiner does not consider such feature to be recited. However, appellants submit that the feature is, in fact, recited in the independent claims and cannot be ignored.

The rejection Under 35 USC 103 based On the Cited Art

Irrespective of the position set forth by the Examiner, appellants submit that the independent and dependent claims of this application recite the features of claim 24, as discussed above, and all claims distinguish over Sofer or Japan 61256282 taken alone or in any combination thereof, and that the additional cited art also fail to disclose or teach the recited features of the independent and dependent claims of this application, as discussed above with respect to claim 24, in the sense of 35 USC 103, such that all claims patentably distinguish over the cited art and should be considered allowable thereover.

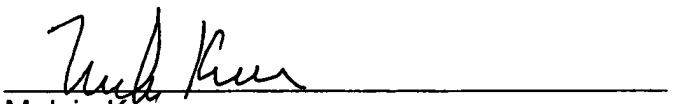
Conclusion

For the foregoing reasons, appellants submit that all claims present in this application are in compliance with 35 USC 112, first and second paragraphs, and that all claims patentably distinguish over the cited art in the sense of 35 USC 103 and appellants request the Board of Appeals to reverse the Examiner's rejection of the claims.

To the extent necessary, appellants petition for an extension of time under 37 CFR 1.136. Please charge any shortage in the fees due in connection with the filing of this paper, including extension of time fees, to the deposit account of Antonelli, Terry, Stout & Kraus, Deposit Account No. 01-2135 (Case: 501.25507CX5), and please credit any excess fees to said deposit account.

Respectfully submitted,

ANTONELLI, TERRY, STOUT & KRAUS, LLP



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